

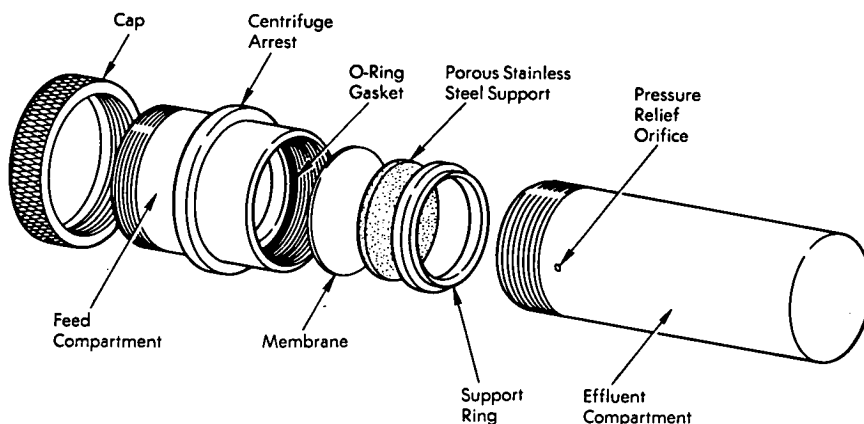
NASA TECH BRIEF

Ames Research Center



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Rapid Evaluation of Reverse-Osmosis Membranes



The evaluation of reverse-osmosis membranes for flux and rejection of solute usually requires that a large number of tests be performed; ordinarily these tests are run one at a time because multiple hydrostatic pressure units are seldom available. However, most laboratories have centrifuges with multiple-compartment heads, and these devices can be used for a number of simultaneous reverse-osmosis tests because sufficient hydrostatic pressure to induce water flow through membranes can be developed by centrifugal force.

The cell shown in the diagram has been designed specifically for use in centrifuges. It is fabricated from stainless steel or Monel; the dimensions of the cell are proportioned to fit the available centrifuge head. The bottom portion, that is, the effluent compartment, screws into the upper portion of the cell (the feed compartment) and compresses the specimen

membrane and its porous stainless steel support against an O-ring. A small hole in the effluent compartment permits equalization of pressure with the ambient pressure in the centrifuge.

Membranes are cut with a die to the appropriate diameter. A single membrane is placed on the porous stainless steel support, the feed compartment is screwed in place and filled with the test solution, and the assembly is placed in the centrifuge head; from one to eight cells can be accommodated in the usual laboratory centrifuge. The centrifuge is operated at the rotational velocity which provides the necessary force to produce a desired water flux. After running for a sufficient amount of time (one to several hours), the flux is determined from the amount of solution collected in the effluent compartment; solute rejection is established by analysis of the effluent and the solution remaining in the feed compartment.

(continued overleaf)

Note:

No additional documentation is available. Specific questions, however, may be directed to:

Technology Utilization Officer
Ames Research Center
Moffett Field, California 94035
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Patent status:

No patent action is contemplated by NASA.

Source: John R. Hollahan and Theodore Wydeven
Ames Research Center
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